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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/711,090	08/20/2004	John C. Tsai	60154.302301	9468

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EXAMINER

LYONS, MICHAEL A

ART UNIT PAPER NUMBER

2877

DATE MAILED: 08/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/711,090

Applicant(s)

TSAI, JOHN C.

Examiner

Michael A. Lyons

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-4 is/are allowed.
- 6) ☒ Claim(s) 5-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 August 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Specification***

The disclosure is objected to because of the following informalities: throughout the specification, instances where degree numbers are disclosed (such as 90°) are all disclosed as 90(.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claims 5-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Claims 5-7 provide for the use of a rotary assembly including multiple corner cube pairs and multiple laser beams of a laser interferometer or laser Doppler displacement sensor to measure rotation in a full circle of a target object, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced. All of claims 5-7 are directed to a use of some sort; claim 5 the using of a rotary assembly, claim 6 the use of measurement in a linear mode, claim 7 the use of measurement in a differential mode.

Claims 5-7 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a

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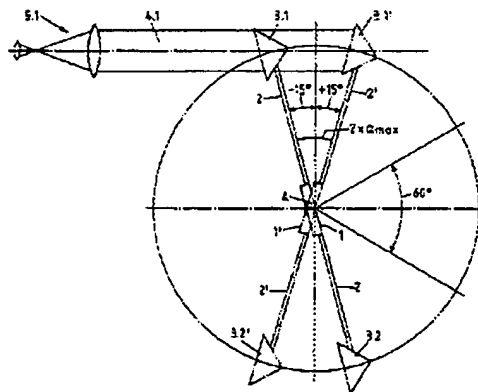
process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meier (6,603,539), as best understood by the examiner.**



Regarding claim 5, Meier (Fig. 1) discloses a method for spatial measurement where corner cube pairs 3.1, 3.2 et al are evenly distributed at opposite ends of the rotational axis A via connection with connecting rod 2. Measurement beam 4.1, secondary to measurement beam 4, strikes the cube on its circular arc as depicted in the figure, and upon reflection, is led together with a suitable secondary reference beam to an interferometer allocated to the reflector for measurement (Col. 4, lines 20-29).

Meier, however, fails to explicitly disclose where the pairs are distributed over a full circle for uninterrupted measurement.

Meier does disclose that the measurement range of the apparatus and corresponding method of Figure 1 is dependent on the size of the reflector, the distance from the rotational axis A, and the optical means with which the secondary measurement beam is produced. The further from the axis, the smaller the range of measurement, and, conversely, the closer to the axis, the larger the range of measurement (Col. 4, lines 45-67).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to position the reflectors of Meier close to the axis A to enable distribution of measurements over a full circle rotation of the axis, the motivation being that such a positioning of the reflectors, along with the appropriate beam expansion with beam widening optics 5.1, will enable uninterrupted interferometric measurement of the displacement of the reflectors and the axis at any time, no matter what degree of rotation the axis undergoes at any time.

As for claim 6, Meier discloses that the target object has a known rotational center at axis point A, with the rotary assembly including corner cubes 3.1, 3.2 et al mounted coaxial to the center (see figure); since the rotational axis is known, measurement inherently occurs in a linear mode.

*Allowable Subject Matter*

**Claims 1-4 are allowed in view of the prior art.**

**Claim 7 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim**

**and any intervening claims, and should the 112 and 101 rejections disclosed above be properly overcome.**

The following is a statement of reasons for the indication of allowable subject matter:

As to claim 1, the prior art of record, taken either alone or in combination, fails to disclose or render obvious an apparatus for use in rotational measurement, the apparatus comprising a rotational assembly that rotates about a rotational axis; at least two interferometers that each direct a measurement beam to the rotational assembly and receives a returned beam back from the assembly; with the assembly comprising a plurality of cube corners mounted so that at least one of the corners is able to receive and reflect to an interferometer a respective measuring beam as the assembly rotates about its rotational axis; with the interferometers combining a reference beam with the received measurement beam into a detection beam that includes an interference signal, thereby permitting rotational measurement of the assembly and any attached work piece target based on processing of the interference signal, in combination with the rest of the limitations of the above claim.

As for claim 7, the prior art of record, taken either alone or in combination, fails to disclose or render obvious the measurement of the location and motion of the corner cubes with laser beams from differential interferometers, the differential interferometers allowing for measurement of the assembly regardless of whether the rotational center of the target object and the rotary assembly are coaxial, in combination with the rest of the limitations of the claim.

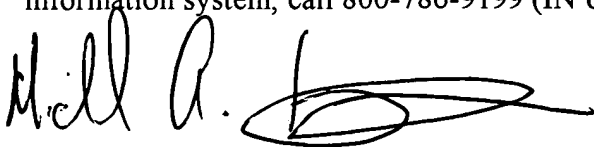
*Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Pat. 5,747,797 to Fujita, US Pat. 5,920,392 to Tsai et al, and US 2002/0093663 to Tsai.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael A. Lyons whose telephone number is 571-272-2420. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley can be reached on 571-272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read "Michael A. Lyons", followed by a large, stylized circular flourish.

Michael A. Lyons  
Patent Examiner, AU 2877  
August 1, 2006